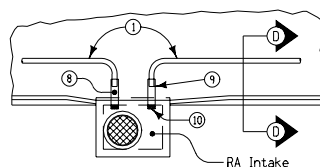
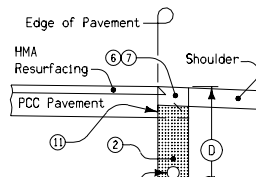


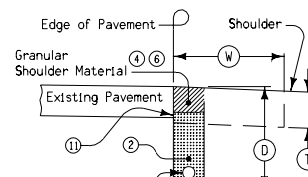
PLAN VIEW OF TYPICAL LONGITUDINAL SUBDRAIN INSTALLATIONS



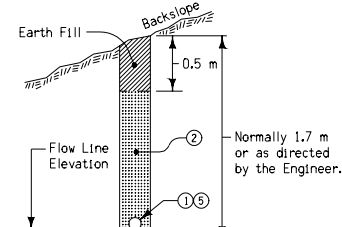
INTAKE OUTLET DETAIL



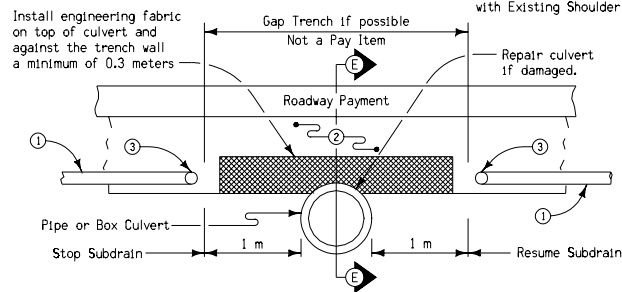
TYPE 9 INSTALLATION  
SECTION C-C  
Composite Pavement  
with Existing Shoulder



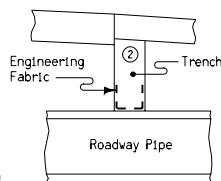
TYPE 10 INSTALLATION  
SECTION C-C  
HMA Base Widening



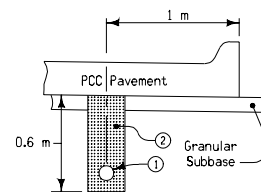
TYPE 11 INSTALLATION  
SECTION B-B  
BACKSLOPE



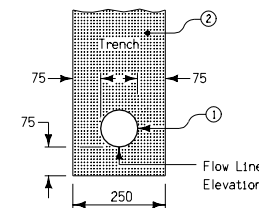
TRENCH REPAIR AT PIPE CULVERT



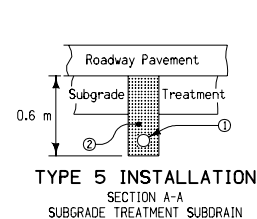
SECTION E-E



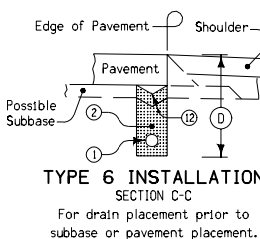
TYPE 12 INSTALLATION  
SECTION D-D



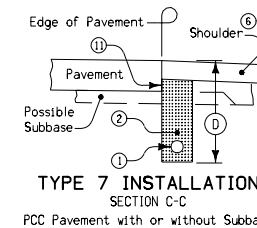
TUBING PLACEMENT DETAIL  
ALL TYPES



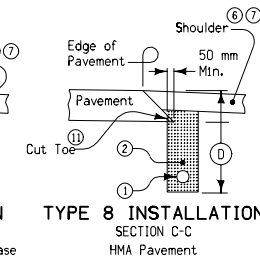
TYPE 5 INSTALLATION  
SECTION A-A  
SUBGRADE TREATMENT SUBDRAIN



TYPE 6 INSTALLATION  
SECTION C-C  
For drain placement prior to  
subbase or pavement placement.



TYPE 7 INSTALLATION  
SECTION C-C  
PCC Pavement with or without Subbase



TYPE 8 INSTALLATION  
SECTION C-C  
HMA Pavement

#### GENERAL NOTES:

Details indicated hereon are for the construction of longitudinal subdrains. Refer to "Tabulation of Longitudinal Subdrains" for details of individual subdrain installations.

When RCB culverts or RF-1 concrete pipe culverts which are less than 0.3 meters below the trench bottom are encountered within a tabulated subdrain, the trench shall stop 1 meter from the culvert and resume 1 meter beyond the culvert. If the trench is inadvertently carried over the culvert, the trench shall be repaired as detailed on this sheet. Care must be exercised so as not to destroy the tops of culverts with the trenching machine. If obstruction is 0.3 meter or more below normal trench bottom, carry subdrain line over in continuous alignment.

Subdrain trench shall typically be located adjacent to edge of roadway pavement. On new construction projects, the subdrain shall be placed after the earth shoulder fill and special backfill, if required, and prior to granular or paved shoulder material. On existing roadways, the trench shall be capped with material per current Standard and Supplemental Specifications.

Porous backfill is considered incidental to "Longitudinal Subdrain".

- (1) 100 millimeter Perforated Subdrain (Polyethylene, Corrugated Tubing).
- (2) Porous Backfill for Subdrain (compacted).
- (3) Subdrain outlets. See Standard Road Plan RF-19E.
- (4) Backfill of this area is not required if base widening is placed the same day of subdrain construction.
- (5) Subdrain is to be installed as cut proceeds.
- (6) On existing Granular or Earth Shoulders, replace with 100 millimeter minimum depth granular shoulder material. Shoulder material will be incidental to the longitudinal subdrain bid item.
- (7) On Paved Shoulders, refer to "Subdrains" in the current Standard Specifications for finishing shoulder.
- (8) 150 millimeter corrugated metal pipe or 100 millimeter corrugated double-walled PE or PVC pipe (0.6 meters long).
- (9) PE or PVC outlet to be connected with an appropriate coupler. CMP outlet to be connected in one of two ways: (1) Inside-fit reducer coupler (0.3 meters min. fit inside CMP); or (2) Insert 0.3 meters of the 100 millimeter subdrain into 150 millimeter CMP and fully seal entire opening with gROUT.
- (10) Removable Grate Rodent Guard. See Materials I. M. 443.01.
- (11) The porous backfill shall be in direct contact with a minimum of 50 millimeters of pavement and continuous to shoulder material as per note 6 or 7.
- (12) "V" notch shall be cut just prior to subbase (if proposed) or pavement placement to assure uncontaminated contact.

All dimensions given in millimeters unless noted.

METRIC VERSION	M	Iowa Department of Transportation Highway Division	
		<b>STANDARD ROAD PLAN</b>	<b>RF-19C</b>
		REVISION: Require Removable Grate Rodent Guard for Intake	REVISION NO. 10
		APPROVED BY <i>William J. Skan</i> DESIGN/METHODS ENGINEER	REVISION DATE 04-15-03
		SUBDRAINS (LONGITUDINAL)	